DRISI

Caltrans Division of Research, Innovation and System Information

Research Results

Warning System for Vehicles Speeding in Work Zones

Smart traffic drums detect speeding vehicles to improve safety in work zones

Transportation Safety and Mobility

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Project Title:
Augmented Speed Enforcement System Prototype Development

Task Number: 2062

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Product Category: New tool and equipment

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WHAT WAS THE NEED?

Although fewer vehicle miles are traveled in rural areas than urban areas, rural areas have approximately 42% more fatal collisions. Speeding and other aggressive behavior are primary contributing factors. Studies have shown that higher collision rates occur at highway locations that temporarily set lower speed limits, such as work zones. Work zone collision rates are especially high on rural two-lane, two-way highways. To address this issue, Caltrans proposed an innovative safety program that is consistent with the objectives of the U.S. Department of Transportation to reduce speed-related collisions with coordinated speed management systems.

WHAT WAS OUR GOAL?

The goal was to develop a practical method for use in rural work zones to detect speeding vehicles and slow down traffic to provide a safer environment for workers and the traveling public and reduce the number and severity of collisions.

The smart drums are placed next to orange traffic cones to indicate the work zone lane closure. The drums flash and send a warning signal when they detect a vehicle exceeding the speed limit.

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WHAT DID WE DO?

Caltrans, in partnership with the Montana State University Western Transportation Institute (WTI), developed a warning system consisting of 28 orange smart drums positioned adjacent to orange cones to mark the work zone lane closure. When the system detects a vehicle that is exceeding the speed limit, the orange lights on top of the drums flash, warning the driver to slow down. The flashing lights also alert workers that a vehicle is speeding through the work zone. If the vehicle speed is above a set speed, the system activates a pager system that also warns the workers of the speeding vehicle. The researchers tested the smart traffic drum system for four weeks on SR 152 near Los Banos.

The University of California, Berkeley Partners for Advanced Transportation Technology (PATH) program also developed a warning system, which was evaluated separately and in conjunction with the WTI system. The PATH system is described in the Research Results for task 2146.

WHAT WAS THE OUTCOME?

The smart drums were able to detect speeding vehicles and synchronously flash warning lights. The pagers vibrated at the detection of a vehicle traveling 20 mph over the speed limit. The speed data collected shows that the system reduced drivers' speed by about 5% (1.7 mph) compared to the baseline speed established before the drums were deployed. When the drums were used in conjunction with the PATH system, vehicle speeds were reduced by approximately 8% (2.4 mph). Researchers found that deploying and retrieving the system daily was labor intensive. Further work is needed to develop a system that workers can easily and quickly deploy.

Frame capture of speeding vehicle

WHAT IS THE BENEFIT?

Rural areas often have less staffing and law enforcement to help control traffic speed in work zones and must instead rely on signage and other methods to slow motorists down. The smart drum speed enforcement system causes drivers to reduce their speed when they see the flashing lights. The lights also warn workers that speeding vehicles are approaching, giving them time to take precautions. The combined effect of slowing traffic and warning workers can reduce the number and severity of collisions in work zones.

LEARN MORE

To view the complete report:
www.dot.ca.gov/research/researchreports/reports/2013/final_report_task_2062b.pdf

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